To: Weaver, Christine[CWeaver@mt.gov]; Mike Suplee[msuplee@mt.gov]; LaVigne, Paul[plavigne@mt.gov]; pskubinna@mt.gov[pskubinna@mt.gov]
Cc: Kusnierz, Lisa[kusnierz.lisa@epa.gov]
From: Laidlaw, Tina
Sent: Fri 2/20/2015 6:29:25 PM
Subject: Whitefish Notes from Nutrient Workgroup Meeting
September12_12sum.pdf

In looking at some MT nutrient workgroup notes, I can across these comments re. Whitefish. Thought you guys might want to see them. I've attached the workgroup notes as well.

Question - Are there Montana communities on addition to Whitefish that use a lagoon system followed by mechanical treatment for phosphorus?

Answer - Whitefish is the only one.

Comment - In addition to reducing ammonia, communities must meet the nitrate human health standard.

Response - I believe that nitrates are already subject to a water quality standard, but I will check existing statutes to be sure. (Note: This is in fact the case; the human health standard of 10 mg NO_3-N/L and 1 mg NO_2-N/L apply.)

Question - If a community uses mechanical treatment for phosphorus, will it be pushed into meeting the 10 milligrams per liter (mg/l) nitrogen standard if the numeric nutrient criteria are adopted?

Answer - Yes. The long-term goal is to meet the water quality standards. Communities using mechanical treatment for phosphorus will need a plan to implement mechanical or biological control for nitrogen as well.

DEQ Nutrient Work Group
19th Meeting Summary
September 12, 2012

Introductions
A list of the members of the Nutrient Work Group (NWG) and others in attendance is attached below as Appendix 1.

Agenda
- Review of the July 23, 2012 Meeting Summary
- Briefing on the Academic Peer Review of Numeric Nutrient Criteria for Wadeable Streams
- Yellowstone River Model Update
- Definition of a Lagoon Designed to Remove Nutrients
- Modifications to the Rule Package in Response to NWG and EPA Comments
- Permit Examples
- Public Comment
- Next Steps

Review of the July 23, 2012 Meeting Summary
NWG members present at this meeting had no comments on the July 23 meeting summary.

Briefing on the Academic Peer Review of Numeric Nutrient Criteria for Wadeable Streams
In June of this year, Dr. Suplee sent the numeric nutrient criteria document to academics outside of the DEQ for a peer review. The review was generally favorable. The reviewers liked DEQ's approach to developing the criteria, using dose response studies with an eye on beneficial uses. They found that DEQ's approach to be as good as or better than that used by other states. The reviewers noted two concerns: first, DEQ did not develop criteria for river breaks, and second, the criteria were not strict enough in western Montana. Dr. Suplee stated that he does not know how to develop criteria specific to river break areas because of their turbidity and the flashiness of the flows there. DEQ opted against stricter criteria in western Montana because the state's standards are based primarily on dose-response studies and demonstrable harm-to-use, not specified percentiles of reference.

Question - How does the peer review process work and how were the reviewers chosen?
Answer - EPA provides states direct support for water criteria development through the Nutrient Scientific Technical Exchange Partnership and Support (N-STEPS) Program. One of the services provided makes academics and others specialists in water quality available to conduct peer reviews of proposed criteria. Reviews through this program are conducted anonymously. DEQ will respond to the review comments and decide what action, if any, to take in response to them.

Question - Does DEQ have the option of agreeing or not agreeing with reviewers' comments?
Answer - Yes.

Question - Were the criteria reviewed those contained in Part A of Circular DEQ-12?
Answer - Yes.

Question - Will the criteria document be published?
Answer - The criteria will be published as a DEQ technical document rather than in a peer reviewed journal. I will seek to publish some aspects of the criteria development and outcomes in journal articles.

Yellowstone River Model Update

Dr. Suplee, Rosie Sada and Kyle Flynn continue to work on development of the Yellowstone River water quality model. This summer, Dr. Suplee, Rosie Sada and others made measurements in the middle river section from Laurel to Billings at ten locations and under two weather conditions. These data will be used to calibrate the model. During the third week of August, measurements were made when the river flowed at the 14Q5 level, i.e., the minimum consecutive fourteen-day average flow which may be expected to occur on the average of once in five years. This condition is ideal for model calibration as it is the same flow for which simulations will be undertaken and for which permits are written. Considering the hot and dry conditions this summer, the river looked good.

Question - When will the Yellowstone River data be available?
Answer - The calibration data set will be collected the third week in September. All of the raw data may be available via the DEQ web site by the end of this year. The model may be completed in a couple of years or less, depending on Mr. Flynn's available time to work on it.

Definition of a Lagoon Designed to Remove Nutrients

Dr. Suplee presented and discussed the following draft definition:

> "Lagoon not designed to actively remove nutrients means a wastewater treatment lagoon (or series of lagoons) that does not have a post-lagoon biological or chemical treatment system intended to reduce nitrogen and/or phosphorus concentrations in the effluent prior to discharge. A lagoon modified solely for the purpose of ammonia removal is not considered to be a lagoon designed to actively remove nutrients."

Comment - Once nutrient standards are adopted, communities will face nutrient removal.
Response - Communities that treat ammonia with lagoons will not have to face immediate nutrient control just because the numeric nutrient criteria are adopted.

Question - If it is economical to add control systems to a lagoon, what will happen?
Answer by Jenny Chambers - DEQ encourages communities that are considering upgrades to their treatment system to look at nutrient treatment.

Question - What about communities using summer land application?
Answer - When land application is used during the summer, no discharge to surface water occurs, so no effluent limits are needed in the summer growing season. The community would not be authorized to discharge in the summer. If there is no other seasonal discharge, then no discharge permit is required.

Question - If a community with a lagoon is treating for phosphorus, will nitrogen treatment also be required once the numeric nutrient criteria are adopted?
Answer - Yes. Phosphorus and nitrogen should be treated together for the basis of this definition.

Question - Why require treating both?
Answer - Our experience is that once communities install the infrastructure to treat one, they move to treat both. Nitrogen limitation is very common in Montana streams and DEQ does not want to see nitrogen reduction left aside.

Comment - Treatment techniques differ for phosphorus and nitrogen. A variance for lagoon systems for nitrogen treatment may be appropriate.

Question - Are there Montana communities on addition to Whitefish that use a lagoon system followed by mechanical treatment for phosphorus?
Answer - Whitefish is the only one.

Comment - In addition to reducing ammonia, communities must meet the nitrate human health standard.
Response - I believe that nitrates are already subject to a water quality standard, but I will check existing statutes to be sure. (Note: This is in fact the case; the human health standard of 10 mg NO_3-N/L and 1 mg NO_2-N/L apply.)

Question - If a community uses mechanical treatment for phosphorus, will it be pushed into meeting the 10 milligrams per liter (mg/l) nitrogen standard if the numeric nutrient criteria are adopted?
Answer - Yes. The long-term goal is to meet the water quality standards. Communities using mechanical treatment for phosphorus will need a plan to implement mechanical or biological control for nitrogen as well.

Modifications to the Rule Package in Response to NWG and EPA Comments

George Mathieus stated that given the comments received, DEQ has decided to postpone the rulemaking on the numeric nutrient criteria rule package. The department is committed to move forward with a rule package that addresses criteria and implementation issues. The primary unresolved issue is how non-degradation will be applied to nutrients. Some comments addressed recurring issues that DEQ believes have been settled. TMDL is an example of the latter. To be clear, no TMDL standard exists. The TMDL group in DEQ applies existing water quality standards in setting waste load allocations in a TMDL. TMDL waste load allocations would be superseded by nutrient variances. We plan to draft responses to the comments that we received and share them with the NWG. We will likely organize the responses to comments into two categories, non-degradation and technical comments, and will group like comments from different commentors together. We will also develop a remaining task list to share with the NWG.

Comment - I am still concerned that TMDLs don't look forward to provide capacity for future development. Understanding how permits will be written for discharges downstream of impaired reaches or lakes is difficult.
Response - The standards will be stricter than TMDL load allocations.

Comment - Even if variances trump TMDL waste load allocations, some discharges would rather not use variances to meet water quality standards.

Comment - Additional case studies involving real-world examples illustrating how the nutrient criteria would translate into permits would be helpful.

Comment - It would be helpful if the engineering community could present some real-world cases.

Question - Will DEQ work with a small group on the non-degradation issue?
Answer - Yes. We have had a group but DEQ has not yet convened it.

Comment - Regarding the timing of proposing the nutrient criteria rule making, it makes sense to wait until after a new Environmental Review Board is appointed by the next governor.

Permit Examples

Dr. Suplee provided the following four permit examples under the proposed numeric nutrient criteria. He noted that permitting would have the following four steps:

1. Determine the reasonable potential to exceed a water quality standard;
2. Calculate the waste load allocation (WLA);
3. Determine long term average effluent discharge concentration, and then the average allowable discharge concentration monthly limit (AML), as mg/L; and
4. Convert AML to load, as lbs/day.

The information Dr. Suplee presented for four examples follows with highlights of the ensuing discussion.

Example 1: New Mine, Headwater Stream

- 10 CFS stream (@14Q5), 100 gpm mine discharge with effluent conc. = 10 mg TN/L (blasting BMPs applied)
- Standard is 0.3 mg TN/L (Middle Rockies ecoregion)

Permit Example Using DEQ-12 Methods

- Reasonable Potential to exceed Standard? Yes – 3.4 mg TN/L after mixing*
- Natural Background (median): 0.141 mg TN/L
- Nondeg max = 40% of stnd: 0.120 mg TN/L
- Use Natural Background (0.141 mg TN/L) since it is naturally higher than 40% of standard
- Permit, no authorization to degrade: Average Monthly Limit of 0.14 mg TN/L, load = 0.17 lbs/day

- Permit, w/authorization to degrade (to 0.3 mg/L): Average Monthly Limit of 7.4 mg TN/L, load= 9 lbs/day

*Assumed 50 mg TN/L as maximum with blasting BMPs, effluent CV = 0.6, n = 3

Conclusion

With some additional water treatment, the mine could meet permit of 7.4 mg TN/L as this is commonly achieved by treatment facilities. Authorization to degrade would be required.

Question - In this case would a variance not mean anything because the non-degradation consideration would be controlling?

Answer - My understanding is that this is correct; however, we are still discussing the implications of a variance and non-degradation rules with our legal staff.

Question - Is non-degradation a national requirement?

Answer - It is a national requirement. Montana's existing non-degradation rules allow a new discharge to degrade water quality up to about half of the standard level. A new discharger may, however, apply for an authorization to degrade water quality which would allow discharges up to the standard. DEQ would authorize the degradation up to the standard if it finds that important social and economic considerations (benefits) would be more important than the water quality degradation.

Comment by George Mathieus - DEQ continues to work with this group to resolve the non-degradation issue.

Comment by Jenny Chambers - The proposed DEQ-12 Circular and rules would assist the permit shop in working with industrial permittees because we will know where the nutrient standards are headed.

Question - Under current rules, is the narrative nutrient standard used to develop nutrient discharge limits?

Answer by Jenny Chambers - Yes. We have done so for the Drumlummon and Montanore mines.

Question - Have you tracked the requests for permits to degrade water quality up to the standard levels?

Answer by Jenny Chambers - We have only had a few applications in the last ten to twenty years.

Example 2: Municipal Wastewater Lagoon

- Facultative lagoon: average discharge concentration of 30 mg TN/L, average flow 0.07 MGD
- Stream of 7 CFS (@14Q5), background = 1.1 mg TN/L
- Standard is 1.4 mg TN/L (NW Great Plains ecoregion)

Permit Example Using DEQ-12 Methods

- Reasonable Potential to exceed Standard? Yes – 3.1 mg TN/L after mixing*. WLA = 21 mg TN/L (12 lbs/day).

- 75-5-313, MCA may now apply: "The Department shall approve the use of a general nutrient standards variance…:"
  - From lagoons that were not designed to actively remove nutrients if the permittee maintains the performance of the lagoon at a level equal to the performance of the lagoon on October 1, 2011.
- Facultative lagoon: Monitored 5-year average = 30 mg TN/L, average flow 0.07 MGD

*Assumed 45 mg TN/L as maximum measured value, CV = 0.6, n=3 samples.

Permit Example Using DEQ-12 Methods
- Using the General Variance, and 4 samples per month monitoring going forward and effluent CV of 0.6:
  - Average Monthly Limit in Permit: 46.5 mg TN/L (27 lbs/day)
  - Applicable for 20 years, or until DEQ updates the general variance requirements for lagoons

Question - How long will lagoons stay current with treatment requirements assuming discharges are not growing?
Answer - In response to an EPA concern, we are trying not to send the message that communities with lagoons need take no action for twenty years. There are alternatives to mechanical treatment systems such as land application and spray irrigation systems.

Comment - Large communities are being required to spend millions to upgrade their treatment systems. Small communities with lagoon systems should not be given a pass from any treatment requirements.
Response - While we are aware of the economic challenges for small systems with few ratepayers, DEQ wants to work with small communities to make progress towards improving water quality.

Comment - As engineers, we are assisting communities with facility planning. What needs to be done over five to ten year time horizons is not clear.
Response - The variance allows 10 mg/L and 1 mg/L for total nitrogen (TN) and total phosphorus (TP), respectively, for plants discharging 1million gallons per day (gpd) or more and 15 mg/L TN and 2 mg/L TP for plants discharging less than 1 million gpd. These levels are in effect interim standards, and the standard levels are the end points. We hope that the engineers will continue to talk with us about the available technologies for possible incremental steps for lagoon systems.

Comment - We need clear regulatory direction for incremental improvements for small community systems, specifically lagoons. DEQ should spell these out in its response to comments on the draft rules.

Comment - The optimization plan required to receive a variance is one mechanism for defining the incremental steps.

Comment - Most optimization plans for lagoon systems will be limited because the plans must address only operational changes and not capital improvements.

Comment - Over a 20-year time frame, growth will force lagoon systems to non-degradation requirements treatment levels.
Response - Few communities in eastern Montana discharge to high quality waters where non-degradation applies.

Comment by George Mathieus - DEQ's philosophy is that we are all in this together. We are interested in ways for lagoons to comply without mechanized treatment systems. There is never a conclusive answer, but we want to move towards something that is sustainable.
Comment - Discreet permit levels discourage small but practical improvements in water quality.

Comment - The goal should be improved water quality not numbers on a page.

Question - How long is required to obtain authorization to degrade water quality?
Answer - Non-degradation is not likely to be an issue for lagoon systems because they do not discharge into high quality waters. DEQ has been working with communities in the eastern Montana oil patch for over a year. We have an FTE dedicated to this task.

Comment - Small communities are driven by operating costs, not capital costs.

Comment - The two bookends for small communities are a 20-year variance and mechanical treatment systems. We need to understand the steps in between.

Example 3: Major Municipal Mechanical Plant into an Impaired River Reach

- River standard = 0.3 mg TN/L
- River in summer (median): 0.56 mg TN/L, 300 CFS
- Reasonable Potential: Facility is 1.1 MGD, effluent is up to 15 mg TN/L. River already above standard, so RP exists
- End-of-pipe permit limit: 0.3 mg TN/L*. This is below DEQ's draft definition of limits of technology, so:
- 75-5-313, MCA may now apply: "The Department shall approve the use of a general nutrient standards variance…:"
  - Facilities > 1 MGD: if permittee treats the discharge to, at a minimum, 1 mg TP/L and 10 mg TN/L as a monthly average
- Based on General Variance, Average Monthly Limit in the permit would be: 11.7 mg TN/L (107 lbs/day)
- Good for up to 20 years or until DEQ updates the General Variance treatment requirements
- If it is demonstrated that the river reach has characteristics that allow higher nutrient concentrations without harming uses, higher criteria concentrations may be warranted. Modeling and instream river monitoring needed.

* Effluent data have CV of 0.2, 10 samples available

Example 4: Private Facility

- River standard = 1.4 mg TN/L
- River in summer (median): 1.0 mg TN/L, 20 CFS
- Reasonable Potential: Facility is 0.6 MGD, effluent is up to 35 mg TN/L. Post-mixing conc. could be 4.7 mg TN/L.* Reasonable Potential Exists
- Calculated AML in permit would be: 10 mg TN/L (50 lbs/day).
- 75-5-313, MCA may now apply: "The Department shall approve the use of a general nutrient standards variance…:"
    - Facilities <1 MGD: if permittee treats the discharge to, at a minimum, 2 mg TP/L and 15 mg TN/L as a monthly average
- Based on General Variance, Average Monthly Limit in the permit for TN would be: 27.8 mg TN/L (139 lbs/day)†
- Good for up to 20 years or until DEQ updates the General Variance treatment requirements
- If it is demonstrated that the river reach has characteristics that allow higher nutrient concentrations without harming uses, higher criteria concentrations may be warranted. Modeling and instream river monitoring needed.

* Effluent data have CV of 0.9, 8 samples available
† Effluent data have CV of 0.9, 4 samples/month will be collected going forward

Comment - We need a better defined pathway for the model and evaluation demonstration.

Additional Examples

George Mathieus asked meeting participants for concerns that should be addressed in additional permit examples.

Comment - The problem is the application to specific communities in the three- or five-year permit cycles and how the permits would be implemented. Examples should address non-degradation and TMDL waste load allocations in specific watersheds.
Response by Jenny Chambers - The permit shop may help define examples based on the discussions we are having with permittees.

Comment - Ammonia and nitrates are major issues for small communities.

Public Comment

There was no additional public comment.

Next Steps

DEQ will write responses to comments on the draft numeric nutrient criteria package and share them with the NWG. It will also continue to work on the non-degradation issue with the small group. DEQ will also prepare a remaining task list to discuss with the NWG. After the comment responses are written and circulated to the NWG, DEQ will schedule the next NWG meeting.

Appendix 1
NWG Attendance List
September 12, 2012

Members

Dave Galt	Montana Petroleum Association
Tom Hopgood	Montana Mining Association
John Wilson	City of Whitefish/Montana League of Cities and Towns (MLCT)
Brian Sugden	Plum Creek
Dave Aune	Great West Engineering
Mark Lambert	Western Environmental Trade Association
John Youngberg	Montana Farm Bureau Federation

Alternate Members

Doug Parker	Hydrometrics (alternate for Tom Hopgood)
Jay Bodner	Montana Stockgrowers Association (alternate for John Youngberg)
Bill Mercer	Holland & Hart (alternate for Dave Galt)

Non-Voting Members

Dr. Mike Suplee	DEQ, Water Quality Standards Section, Water Quality Specialist
George Mathieus	DEQ Planning, Prevention and Assistance Division Administrator
Dr. Jeff Bland	DEQ Economist

Other Meeting Participants

Patrick Murtagh	Murtagh Municipal Engineering
Alec Hansen	Montana League of Cities and Towns
Amanda McInnis	HDR
Mark Simonich	Helena Association of Realtors
David Mumford	City of Billings
John North	DEQ Attorney
Eric Urban	DEQ Water Quality Standards
John North	DEQ Attorney
Jenny Chambers	DEQ Water Protection Bureau Chief
Jessie Luther	Browning, Kaleczyc, Berry & Hoven
Tina Laidlaw	EPA
Judel Buls	AE2S, Inc.
Nate Weisenburger	AE2S, Inc.
Todd Teagarden	DEQ

NWG Facilitator

Gerald Mueller	Consensus Associates